
TruthTable

$$Prime2Not(AE) := \begin{cases} \text{if } (y := \text{findstr}(\text{num2str}(AE), "")) = -1 \\ AE \\ \text{else} \\ \left[\begin{array}{l} L := \text{concat}(\text{num2str}(AE), " ") \quad n := \text{strlen}(L) \\ \text{for } k \in [1..\text{length}(y)] \\ L := \text{concat}\left(\text{substr}(L, 1, y_k - 2), "-", \text{substr}(L, y_k - 1, 1), \text{substr}(L, y_k + 1, n - y_k)\right) \\ \text{str2num}(\text{substr}(L, 1, n - 1)) \end{array} \right] \end{cases}$$

$$TruthTable(AE) := \left[\begin{array}{l} L := Prime2Not(AE) \quad U := \text{Unknowns}(L) \quad n := \text{length}(U) \quad r := [1..n] \\ \left[\begin{array}{l} T := \text{matrix}(1, n + 1) \quad T_r := \text{num2str}(U_r) \quad T_{n+1} := \text{"Ans"} \end{array} \right] \\ \text{for } k \in [1..2^n] \\ \left[\begin{array}{l} y := \text{eval}\left(\text{reverse}\left(\overrightarrow{\text{mod}\left(\left[(k-1) \cdot 2^{1-r}\right], 2\right)}\right)\right) \\ T := \text{eval}\left(\text{stack}\left(T, \text{augment}\left(y^T, L \mid \text{mat2sys}(y) \neq 0\right)\right)\right) \end{array} \right] \end{array} \right]^T$$

$$b2a(AE) := \begin{cases} _not(a) := \text{if } \text{strlen}(\text{num2str}(a)) = 1 \\ \quad \text{str2num}(\text{concat}(\text{num2str}(a), "")) \\ \text{else} \\ \quad \neg a \end{cases} \\ \text{str2num}\left(\text{strrep}\left(\text{strrep}(\text{num2str}(\text{eurep}(AE, \neg a, _not(a))), "|", "+"), "&", "*" \right)\right)$$

$$a2b(LE) := \text{str2num}\left(\text{strrep}\left(\text{strrep}(\text{num2str}(Prime2Not(LE))), "+", "|"), "*", "&" \right)$$

Example Use $[* = \text{and } + = \text{or } ' = \text{not }]$ or $[\& = \text{and } | = \text{or } \neg = \text{not }]$ in a string

$$L := A' \cdot B + B \cdot C' + B \cdot C + A \cdot B' \cdot C'$$

$$A := \text{str2num}("-A\&B|B\&-C|B\&C|A\&-B\&-C")$$

$$TruthTable(L) = \begin{bmatrix} \text{"A"} & \text{"B"} & \text{"C"} & \text{"Ans"} \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & 1 & 1 & 1 \\ 1 & 0 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

$$TruthTable(A) = \begin{bmatrix} \text{"A"} & \text{"B"} & \text{"C"} & \text{"Ans"} \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & 1 & 1 & 1 \\ 1 & 0 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

$$b2a(A) = B \cdot (A' + C' + C) + A \cdot B' \cdot C'$$

$$a2b(L) = (B \wedge ((C \vee \neg A) \vee \neg C)) \vee ((A \wedge \neg B) \wedge \neg C)$$

Issue The precedence of booleans and, or isn't the same than plus, times respect inequalities:

$$L := (A + B) > 2 = A + B > 2 \quad \text{but} \quad A := \text{str2num}\left(\text{strrep}(\text{num2str}(L), "+", "|")\right) = A \vee (B > 2)$$

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